

**ABSTRACT OF THE DISCLOSURE**

An EGR fault/failure determination system for an internal combustion engine is operable to monitor a number of EGR system operational parameters and diagnose various EGR-related fault and failure statuses therefrom. For example, the system is operable to determine a number of EGR system-related fault and failure conditions by monitoring measured and command EGR position signals to determine EGR valve controller functionality, to monitor response times between fully open and closed EGR valve positions by comparing measured response times to a calibratable response time value, and to monitor in-range EGR position failures associated with fully closed and fully opened EGR valve position values. The system further includes a Kalman filter-based fault/failure isolation feature operable to isolate and identify one or more sources of EGR valve-related faults/failures.